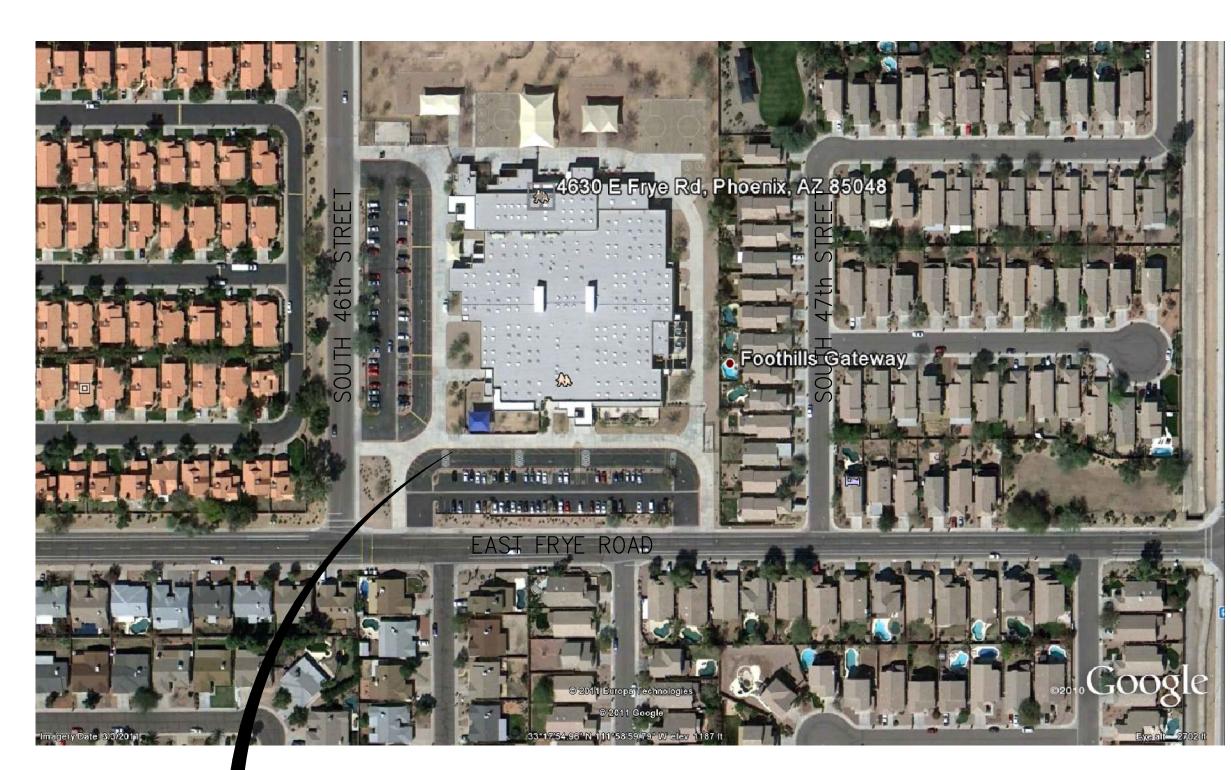
KYRENE SCHOOL DISTRICT COOLING TOWER REPLACEMENT

FOR

KYRENE del MILENIO ELEMENTARY SCHOOL



SHEET INDEX COVER SHEET DEMOLITION FLOOR PLAN NEW FLOOR PLAN AND DIAGRAM LEGEND, SCHEDULES AND DETAILS ELECTRICAL SYMBOLS LIST AND NOTES ELECTRICAL SITE PLAN ELECTRICAL DEMOLITION FLOOR PLAN NEW ELECTRICAL FLOOR PLAN ONE LINE DIAGRAM PARTIAL FOUNDATION PLAN

SCOPE OF WORK

- Remove and replace the existing cooling towers, tower supports, floor sink, etc.
- Install new galvanized cooling towers, structural tower supports, floor sink, etc. Reconfigure and reconnect towers (provide new BFV's at the towers), provide existing water make—up, electrical and controls.

ALTERNATE *1 BID

- Also remove and replace the pumps, piping, water treatment, floor sink, etc.
- Install new fiberglass cooling towers, pumps, piping, valves, VFD's, water treatment, heat exchanger, tower filters, new tower water make-up, floor sink, electrical, controls, etc.
- All work indicated on these mechanical and electrical

'KYRENE del MILENIO ELEMENTARY SCHOOL

4630 S. FRYE ROAD PHOENIX, ARIZONA 85048

MECHANICAL AND ELECTRICAL ENGINEERS.



LSW ENGINEERS ARIZONA, INCORPORATED 2333 WEST NORTHERN AVENUE PHOENIX, ARIZONA 85021 (602) 249-1320

STRUCTURAL ENGINEERS

GERVASIO AND ASSOCIATES, INC. 77 E. THOMAS ROAD, STE 120 PHOENIX, ARIZONA 850152 (602) 285-1720

2006 PHOENIX BUILDING CODE 2006 PHOENIX RESIDENTIAL CODE 2006 PHOENIX EXISTING BUILDING CODE

2006 PHOENIX MECHANICAL CODE

2006 PHOENIX PERFORMANCE CODE

2006 UNIFORM PLUMBING CODE WITH PHOENIX AMENDMENTS (148KB), 1 TABLE 11-1 2007 ASME A17.1 SAFETY CODE FOR ELEVATORS AND ESCALATORS WITH PHOENIX AMENDMENTS

2008 ASME A18.1 SAFETY CODE FOR PLATFORM LIFTS AND STAIRWAY CHAIRLIFTS

CODE DATA

CITY OF PHOENIX CODES

2006 PHOENIX ENERGY CONSERVATION CODE

2006 PHOENIX FUEL GAS CODE 2006 PHOENIX FIRE CODE

2008 NATIONAL ELECTRICAL CODE/NFPA-70 WITH PHOENIX AMENDMENTS

2007 ASME A17.7 PERFORMANCE-BASED SAFETY CODE FOR ELEVATORS AND ESCALATORS 2002 ASME A17.3 SAFETY CODE FOR EXISTING ELEVATORS AND ESCALATORS WITH PHOENIX AMENDMENTS

2011-097.000

KYRENE ELEMENT

SHEET NO.

02/17/12

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Z

- R SHALL EXAMINE ALL GENERAL AVE HAD VISITED THE CONSTRUCTION SITE. NG CONDITIONS UNDER WHICH HE WILL HAVE NAY AFFECT THE WORK UNDER THIS CONTRACT. ADE IN THIS CONNECTION ON BEHALF OF THE GENCE ON HIS PART.
- EXISTING ELECTRICAL WIRING WHICH WILL NOT BE MADE OBSOLETE AND WHICH WILL BE DISTURBED DUE TO CONSTRUCTION CHANGES REQUIRED BY THIS CONTRACT SHALL BE RESTORED TO OPERATING CONDITION, AS REQUIRED AND/OR DIRECTED.WHERE REQUIRED, SHOWN AND/OR DIRECTED, OUTLETS AND CONDUIT RUNS SHALL BE RELOCATED.IN SOME CASES IT MAY BE NECESSARY TO EXTEND CONDUITS AND PULL IN NEW WIRING OR INSTALL JUNCTION BOXES AND SPLICE IN NEW WIRING OR REPLACE OLD WIRING WITH NEW.
- OUTLETS FROM WHICH FIXTURES, SWITCH CAL DEVICES ARE MOVED AND WHICH AIREMOVED OR, IF IT IS NOT POSSIBLE TO OUTLET BOX.WHERE OUTLETS, BOXES, ET CONTRACTOR SHALL CUT OFF CONDUITS HES, RECEPTACLES, AND/OR OTHER ELECTRI-VRE NOT REPLACED OR REUSED SHALL BE D REMOVE, PLACE A BLANK COVER ON THE TC., ARE COMPLETELY REMOVED, THE S AND REMOVE WIRING.
- WHERE EXISTING LIGHT FIXTURES ARE TO SHALL CLEAN AND REPLACE LAMPS, REBALLAST, ETC. AS REQUIRED. O BE REUSED, THE ELECTRICAL CONTRACTOR
- WHERE CONDUITS EXTENDING THROUGH CONTRACTOR SHALL CUT AND CAP OR ABOVE THE FLOOR. FLOOR SLABS ARE TO BE ABANDONED, THE PLUG CONDUIT SUCH THAT IT WILL NOT PROTRUDE
- WHERE EXISTING CONDUIT IS TO BE ABANDONED, THE CONDUIT SHALL BE REMOVED IF IT IS EXPOSED, IN A CRAWL SPACE OR IN AN ACCESSIBLE CEILING.WHERE IT IS IMPOSSIBLE TO REMOVE THE CONDUIT, IT SHALL BE CUT OFF AND CAPPED OR PLUGGED. Y RESPONSIBLE FOR THE PROPER RESTORA-RING PATCHING, PLASTERING, PAINTING STALLATION OF ELECTRICAL WORK UNDER THE LOPENINGS, REPAIR ALL SURFACES, ETC.,

FLOOR OUTLET - DEVICE INDICATED

JUNCTION BOX WITH FLEXIBLE METALLIC CONDUIT CONNECTION TO EQUIPMENT

PH0T0CELL

JUNCTION BOX

TRACK LIGHTING

NOTE:

ALL CONVENIENCE OUTLETS AND LIGHTING SWITCHES SHALL BE MOUNTED AT A HEIGHT TO MEET OR EXCEED THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS. UNLESS NOTED OTHERWISE, THESE SHALL BE:

RECEPTACLES -SWITCHES

15" (TO BOTTOM OF DEVICE) A.F.F.
- 48" (TO TOP OF DEVICE) A.F.F.

SINGLE CONVENIENCE RECEPTACLE

DUPLEX RECEPTACLE—SLASH INDICATES OUTLET MOUNTED ABOVE COUNTER (THIS APPLIES TO $\underline{\mathsf{ALL}}$ TYPES OF OUTLETS) (CONFIRM HEIGHT AND LOCATION)

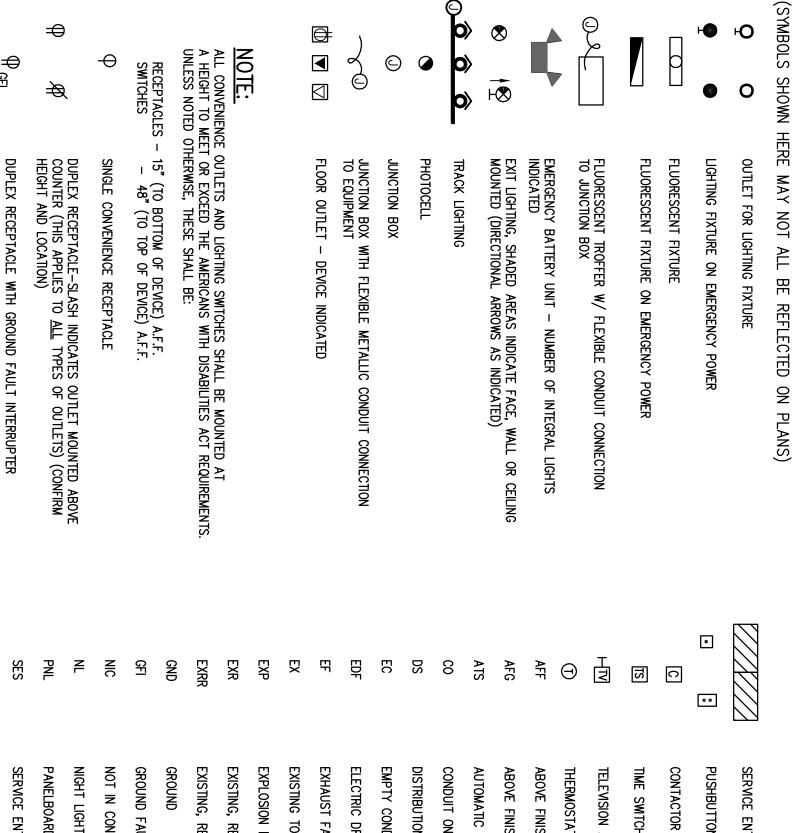
- THE CONTRACTOR SHALL EMPLOY QUALIFIED AND EXPERIENCED WORKMEN FOR THIS WORK.ALL RESTORATION WORK SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER AND/OR THE OWNER. THE CONTRACTOR SHALL BE HELD FULL TION OF ALL EXISTING SURFACES REQUIREND/OR OTHER REPAIR DUE TO THE INSTERMS OF THIS SPECIFICATION.CLOSE ALAS REQUIRED.
- EXAMINE MECHANICAL DRAWINGS AND SPECIFICATIONS TO DETERMINE THE SEQUENCE OF CONSTRUCTION THROUGHOUT THE PROJECT, ALL TEMPORARY AND REMODELING WORK SHALL BE CONSIDERED A PART OF THIS CONTRACT AND NO EXTRA CHARGES WILL BE ALLOWED.THIS SHALL INCLUDE MINOR ITEMS OF MATERIAL OR EQUIPMENT NECESSARY TO MEET THE REQUIREMENTS AND INTENT OF THE PROJECT.
- RING AN OUTAGE SHALL BE MADE DURING AN S SHALL BE AS SHORT A DURATION AS POSSIBLE AN AL OPERATION OF THE OWNER'S FACILITIES.

 NCE OF A SHUTDOWN OF ANY ELECTRICAL A CHANGEOVER SHALL BE DONE DURING SHALL BE SCHEDULED SO THAT AT NO TIME IT, OR FIRE ALARM ZONE BE OUT OF SERVICE.

 DERS TO ACCOMPLISH THIS REQUIREMENT.

∯ GH

(SYMBOLS SHOWN HERE MAY NOT ALL BE REFLECTED ON PLANS) <u>ELECTRICAL</u> SYMBOL



		SERVICE ENTRANCE OR DISTRIBUTI
CY POWER	•	PUSHBUTTON
	0	CONTACTOR
RGENCY POWER	TS	TIME SWITCH
XIBLE CONDUIT CONNECTION	\vdash \Box	TELEVISION ANTENNA SYSTEM OUT
	Θ	THERMOSTAT
IUMBER OF INTEGRAL LIGHTS	AFF	ABOVE FINISHED FLOOR (TO CENT

TION SECTION

ABOVE FINISH GRADE (TO CENTER LINE OF ITEM)

AUTOMATIC TRANSFER SWITCH

RIBUTION SECTION

(HAUST FAN (ISTING TO REMAIN ECTRIC DRINKING FOUNTAIN PTY CONDUIT

XISTING, REMOVE AND XISTING, REMOVE (PLOSION PROOF

ROUND FAULT INTERRUPTER DEVICE

SERVICE ENTRANCE SECTION ANELBOARD NOT IN CONTRACT IGHT LIGHT

NEATHERPROOF JNLESS NOTED OTHERWISE TELEPHONE TERMINAL CABINET WITCHBOARD

ONE LINE SYMBOLS

GROUND FAULT SENSOR AND RELAY EQUIPMENT ENCLOSURE

MMETER WITH PHASE SELECTOR SWITCH

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 S_3

THREE WAY SWITCH

DOUBLE POLE SWITCH

SINGLE POLE SWITCH

RECEPTACLE ON EMERGENCY POWER

QUADRAPLEX RECEPTACLE ISOLATED GROUND TYPE

DUPLEX RECEPTACLE ISOLATED GROUND TYPE

DUPLEX RECEPTACLE SPLIT WIRED

QUADRAPLEX RECEPTACLE OUTLET.

DUPLEX RECEPTACLE WITH GROUND FAULT INTERRUPTER

OTENTIAL TRANSFORMER OLTMETER WITH PHASE/NEUTRAL SELECTOR SWITCH ATT-HOUR METER RRENT TRANSFORMER

ELECTRIC MOTOR — HORSEPOWER, FLA INDICATED CIRCUIT BREAKER — NDICATED IDICATES DRAWOUT DEVICE AGNETIC MOTOR STARTER-NUMBER OF POLES

GENERAL

COORDINATE SCHEDULE OF CONSTRUCTION WITH THE OWNER, OTHER TRADES AND UTILITIES INVOLVED BEFORE INSTALLATION OF UNDERGROUND FEEDERS, TRENCHING, ETC.

USE EXTREME CAUTION DURING EXCAVATION. THE CONTRACTOR SHALL BE REQUIRED TO HIRE THE SERVICES OF AN UNDERGROUND UTILITIES LOCATING SERVICE. LOCATE EXISTING UNDERGROUND PIPING, CONDUITS, ETC. LOCATE AND PROTECT ANY BURIED UTILITIES IN AREAS OF EXCAVATION.

DRAWINGS SHOW EXISTING CONDITIONS TO SHOW EXISTING BUILDINGS, SITE DE GUARANTEED. VERIFY EXACT LOCATIONS EQUIPMENT, ETC. VERIFY ALL SITE AND

OF THE SITE.AN ATTEMPT HAS BEEN MADE TAILS, ETC., BUT ACCURACY CANNOT BE OF ALL CIRCUITS, CONDUITS, PIPING, BUILDING DETAILS.

GROUT AND SEAL ALL CONDUIT PENETI PRESERVE FIRE RATING AND WATERTIGI

RATIONS OF WALLS AND FLOOR SLABS TO HT INTEGRITY.

 \Rightarrow

EXISTING DEVICES ARE INDICATED AS DASHED

CONDUIT STUB-OUT, BUSH CAP AND PERMANENTLY MARK LOCATION.

 $\frac{30-3}{NF}$

CONDUIT W/O INDICATION SHALL BE TWO CONDUCTORS #12 AWG. MIN. IN 3/4" CONDUIT. CIRCUIT, PANEL & CONDUIT INDICATION. HASH MARKS INDICATE QUANTITY OF CONDUCTORS (GROUND WIRES ARE NOT SHOWN, BUT SHALL BE INSTALLED IN CONDUIT)

CONDUIT CONCEALED IN OR UNDER FLOOR CONSTRUCTION

CONDUIT CONCEALED IN CEILING OR WALL CONSTRUCTION

15 HP 21 FLA

OUTLET OR SWITCH CONTROL INDICATION

WALL DIMMER, 1500 WATT MINIMUM, LUTRON NOVA SERIES

FOUR WAY SWITCH

)RY-TYPE STEP-DOWN TRANSFORMER-KVA AND 9HASE INDICATED WITCH — AMPERAGE AND NUMBER OF POLES INDICATED

GENERATOR AUTOMATIC TRANSFER SWITCH-AMPERAGE AND NUMBER OF POLES INDICATED

-WWY-□ 10 KW

ELECTRIC HEATER-SIZE IN KW AS INDICATED

MANUAL MOTOR STARTER W/ THERMAL OVERLOAD PROTECTION

PANELBOARD

TRANSFORMER

HORSE POWER RATED FAN SWITCH

\ \

FUSED DISCONNECT SWITCH, NF SUBSCRIPT INDICATES NON-FUSED

MOTOR CONTROLLER FURNISHED WITH EQUIPMENT

MOTOR CONTROLLER SIZE AS INDICATED

MOTOR, SIZE AND RATING INDICATED

EXISTING CIRCUIT - REMOVE AS INDICATED

EXISTING CONDUIT TO REMAIN. PROVIDE NEW CONDUCTORS AS SHOWN

COMBINATION MOTOR CONTROLLER & DISCONNECT SWITCH

SHEET 02/17/12 רם פי 2011-097.000 CKD. BY

ELECTRICAL SYMBOLS AND NOTES

KYRENE del MILENIO **ELEMENTARY SCHOOL**

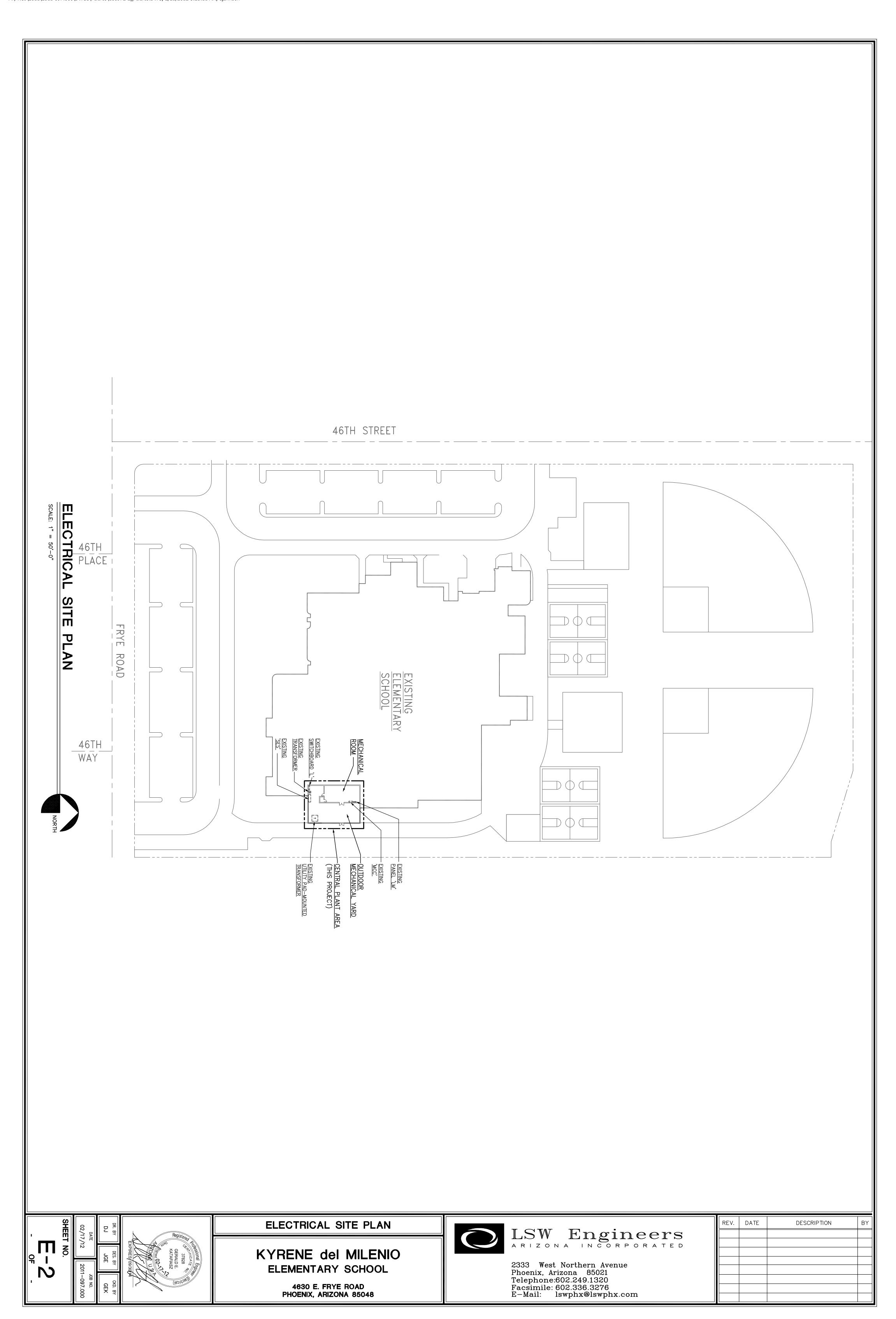
4630 E. FRYE ROAD PHOENIX, ARIZONA 85048

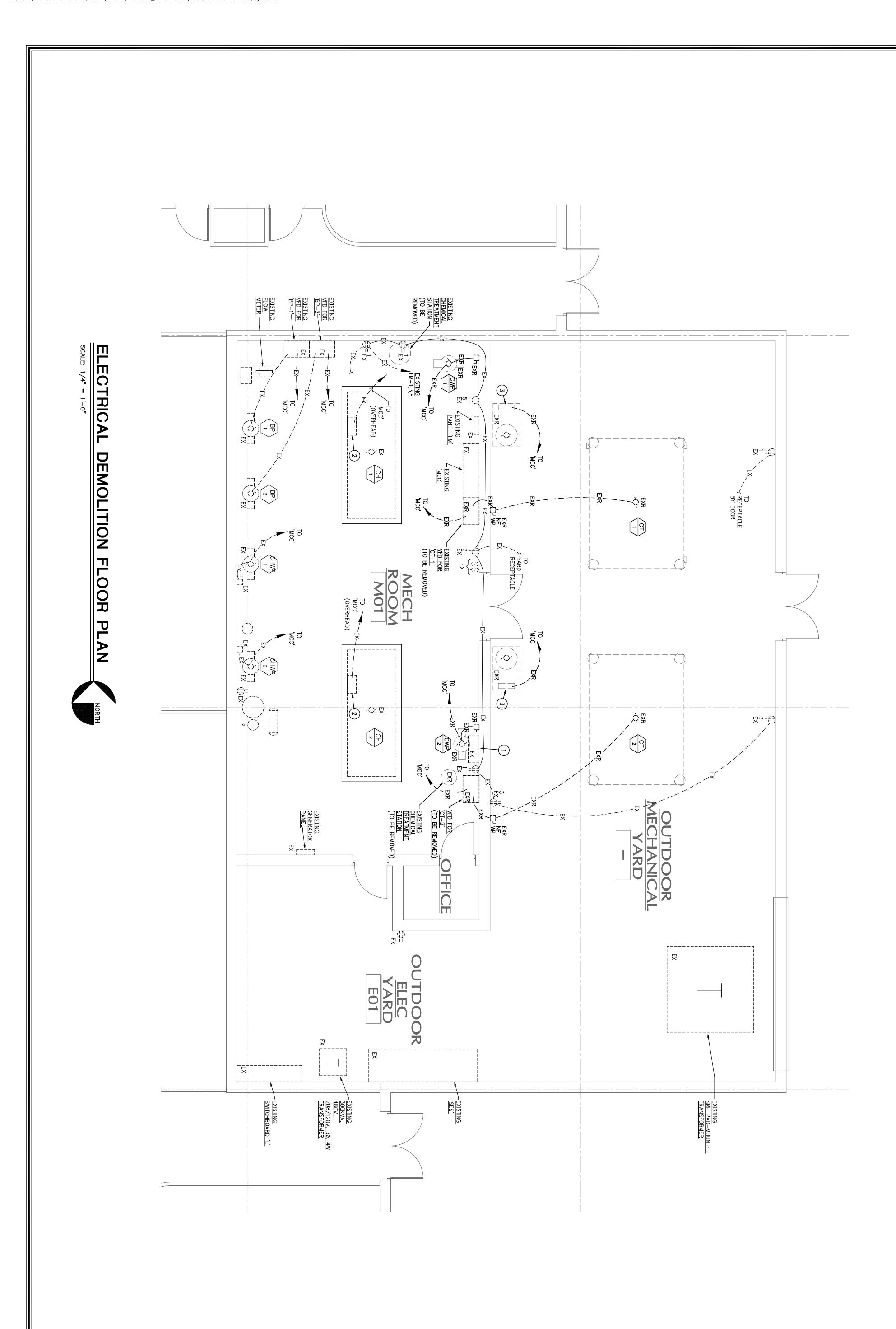


Engineers

2333 West Northern Avenue Phoenix, Arizona 85021 Telephone:602.249.1320 Facsimile: 602.336.3276 E-Mail: lswphx@lswphx.com

REV.	DATE	DESCRIPTION	BY





KEYED NOTES ():

1. EXISTING CONTROL PANEL TO REMAIN.

2. EXISTING CHILLER CONTROL PANEL TO REMAIN.

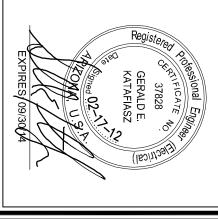
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DES. BY
JGE
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DATE
02/17/12

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ELECTRICAL DEMOLITION FLOOR PLAN

KYRENE del MILENIO ELEMENTARY SCHOOL

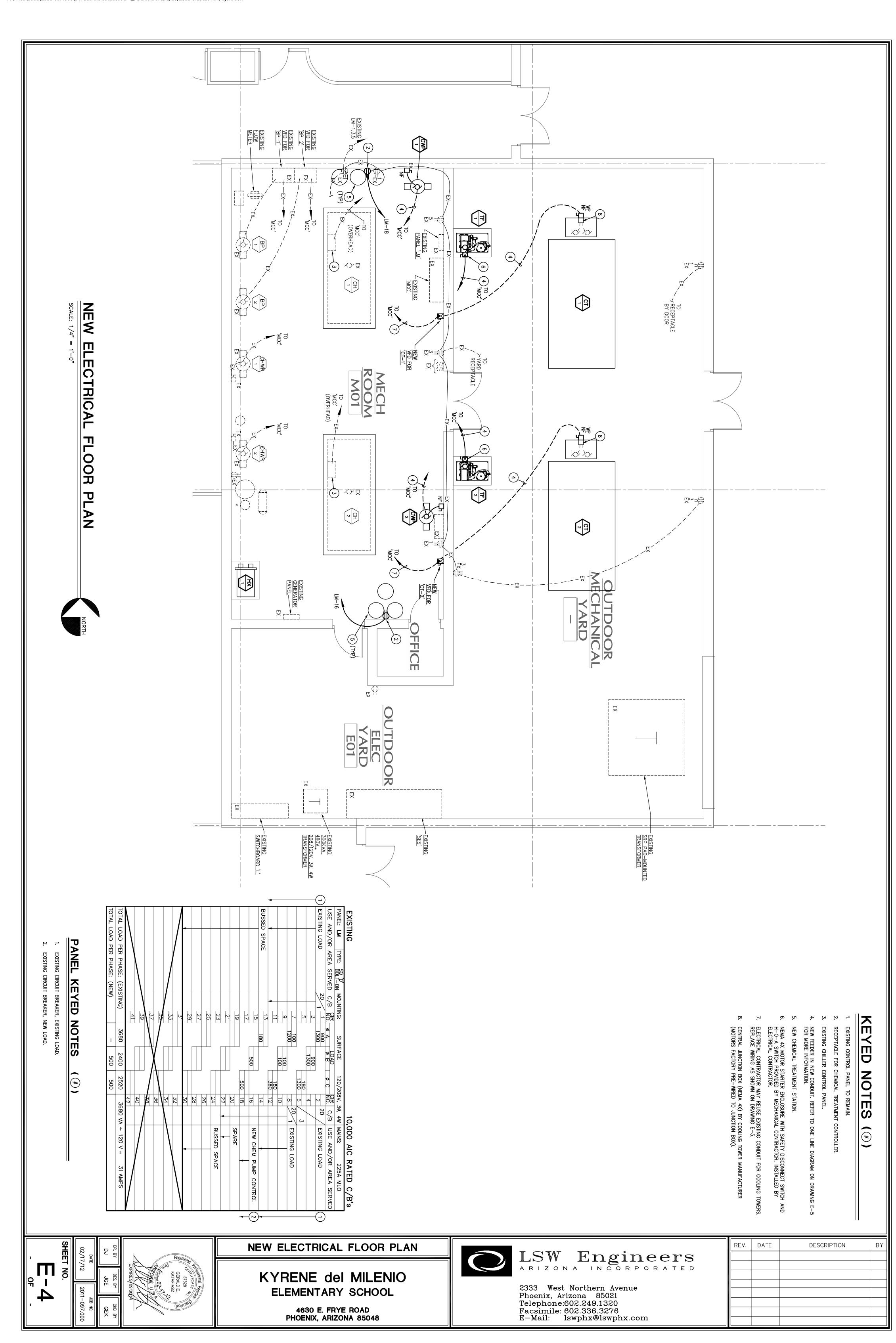
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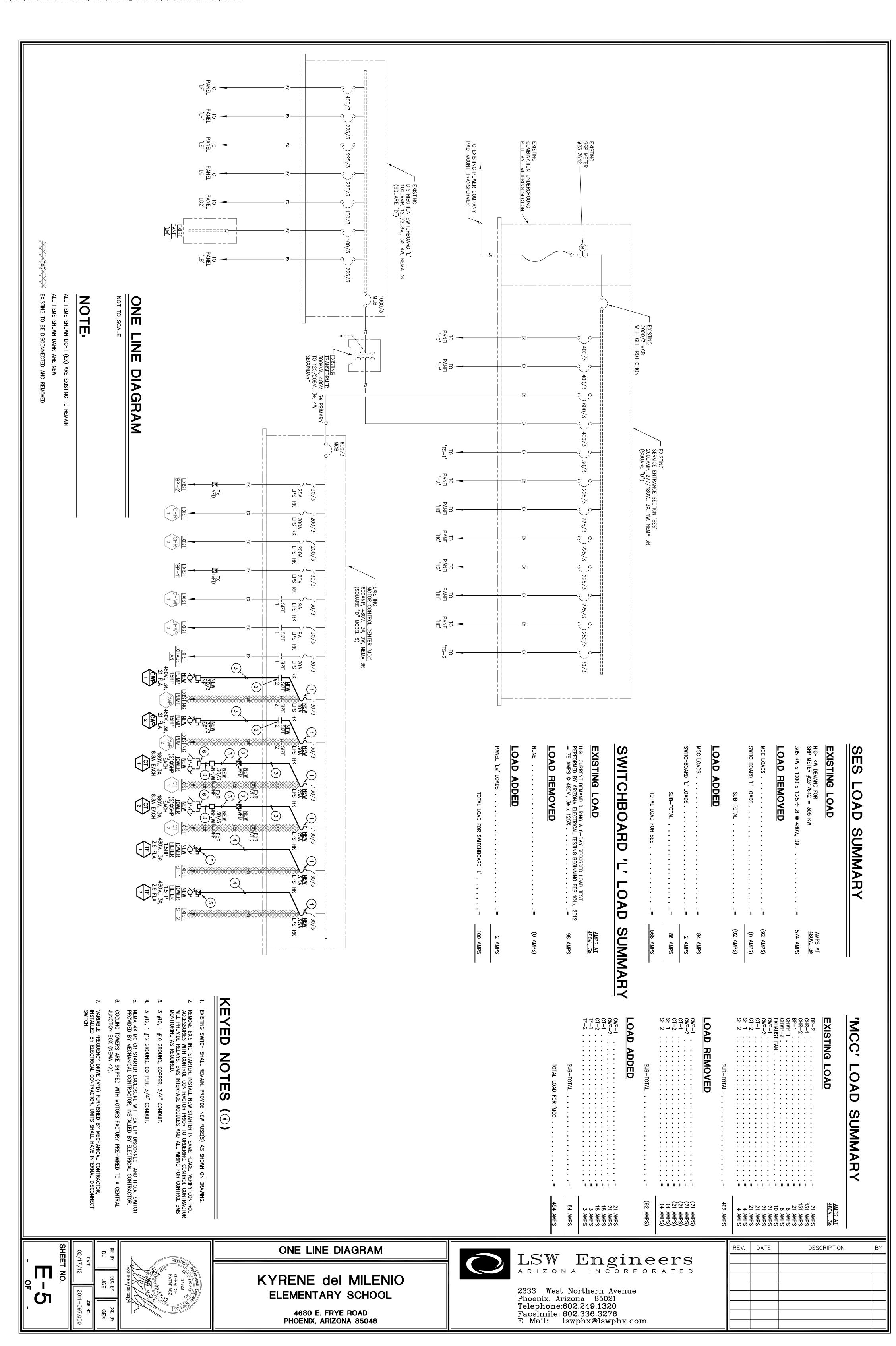


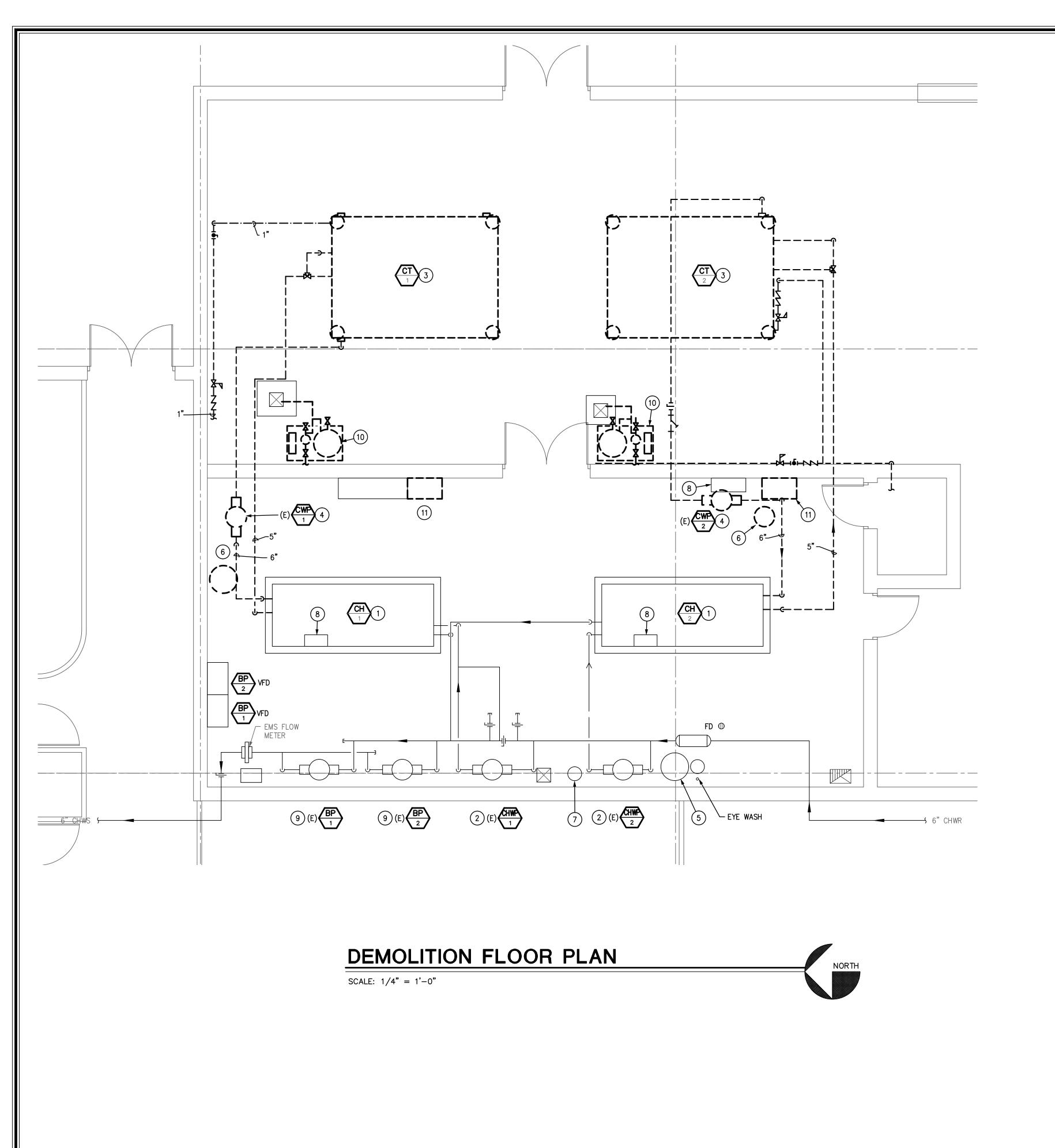
LSW Engineers
ARIZONA INCORPORATED

2333 West Northern Avenue Phoenix, Arizona 85021 Telephone:602.249.1320 Facsimile: 602.336.3276 E-Mail: lswphx@lswphx.com

REV.	DATE	DESCRIPTION	BY

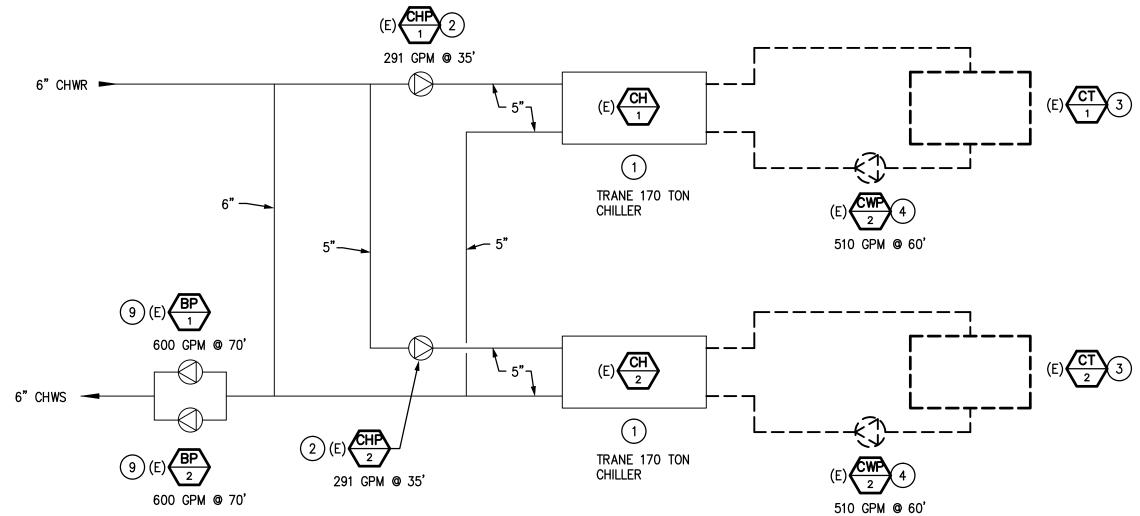




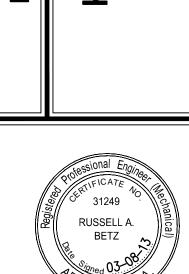


KEYED NOTES (#)

- 1. EXISTING CHILLER TO REMAIN.
- 2. EXISTING CHILLED WATER PUMP TO REMAIN.
- 3. REMOVE EXISTING COOLING TOWER AND ASSOCIATED PIPING FOR INSTALLATION OF NEW TOWER.
- 4. REMOVE EXISTING TOWER CONDENSER PUMP.
- 5. EXISTING EXPANSION TANK TO REMAIN.
- 6. REMOVE EXISTING CHEMICAL TREATMENT STATION.
- 7. EXISTING POT FEEDER TO REMAIN.
- 8. EXISTING CONTROL PANEL TO REMAIN.
- 9. EXISTING BUILDING CHILLED WATER PUMP TO REMAIN.
- REMOVE EXISTING TOWER FILTRATION SYSTEM AND ALL ASSOCIATED PIPING FOR NEW UNIT.
- 11. REMOVE EXISTING COOLING TOWER VFD.



CENTRAL PLANT DEMOLITION SCHEMATIC DIAGRAM

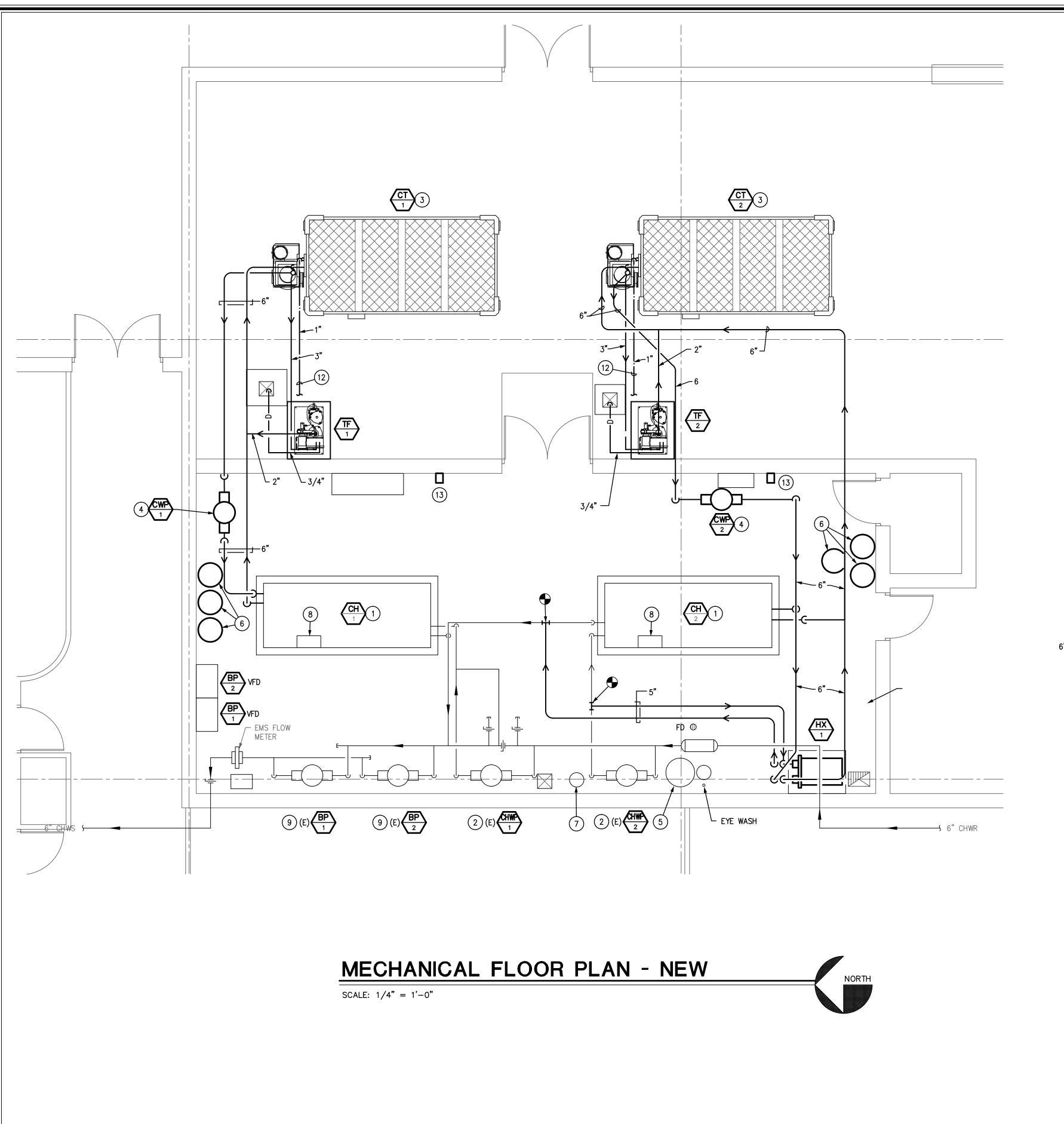


SHEET NO.

M-1

FLOOR PLAN DEMOLITION

02/17/12

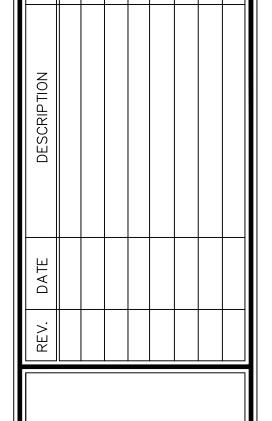


KEYED NOTES (#)

- 1. EXISTING CHILLER TO REMAIN.
- 2. EXISTING CHILLED WATER PUMP TO REMAIN.
- 3. NEW COOLING TOWER (REFER TO DETAIL ON SHEET M-4)
- 4. NEW TOWER CONDENSER PUMP.
- 5. EXISTING EXPANSION TANK TO REMAIN.
- 6. NEW CHEMICAL TREATMENT STATION.
- 7. EXISTING POT FEEDER TO REMAIN.
- 8. EXISTING CONTROL PANEL TO REMAIN.
- 9. EXISTING BUILDING CHILLED WATER PUMP TO REMAIN. 10. NEW TWO-POSITION MOTOR OPERATED VALVE.
- 11. NEW HEAD PRESSURE MODULATING MOTOR OPERATED VALVE CONTROLLED BY CHILLER
- 12. RECONNECT TO EXISTING TOWER MAKE-UP WATER.
- 13. NEW COOLING TOWER VFD.

GENERAL NOTES:

PROVIDE WHEEL HANDLED GEAR DRIVE ACTUATORS ON ALL BUTTERFLY VALVES.



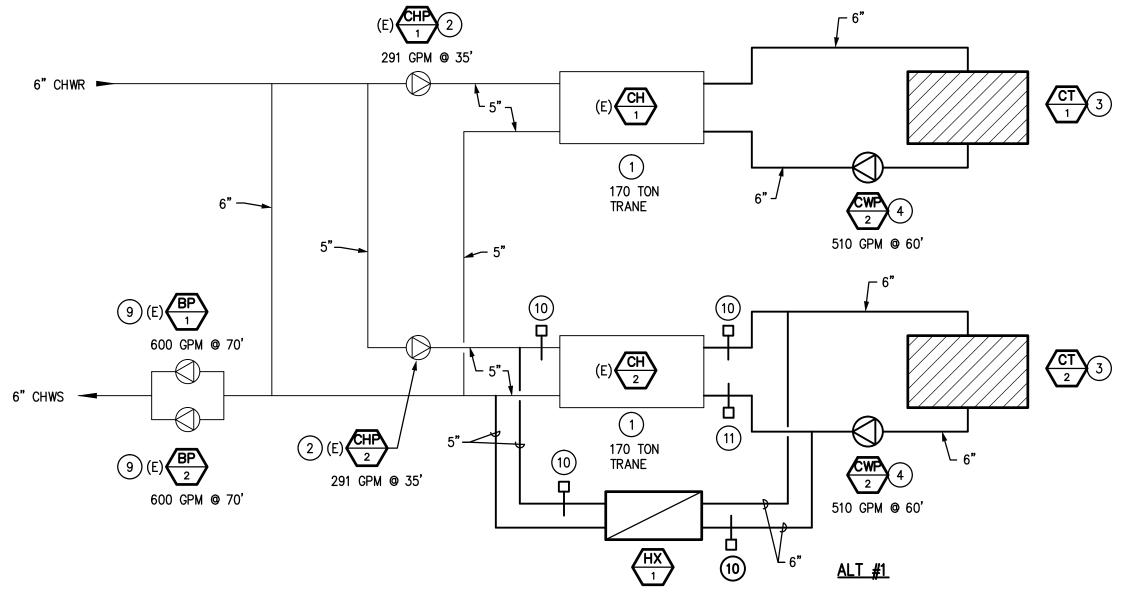




02/17/12

SHEET NO.

M-2



CENTRAL PLANT NEW SCHEMATIC DIAGRAM

	PLATE AND FRAME HEAT EXCHANGER SCHEDULE												
						COLD	SIDE			НОТ	SIDE		
MARK	AREA SERVED	MANUFACTURER	MODEL	MBH	GPM	MAX ΔP (FT)	ENT WTR TEMP (°F)	LVG WTR TEMP (°F)	GPM			LVG WTR TEMP (°F)	
HX-1	CH-2 / CT-2	MUELLER	AT40MV	1164	510	11.6	50.0	54.6	291	4.2	61.0	53.0	4" CONN., 100 PLATES

	PUMP SCHEDULE												
	HEAD MIN MAX MOTOR									DEMARKS			
MARK	AREA SERVED	MANUFACTURER	MODEL	TYPE	GPM	(FT) H20	EFF %	NPSHR (FT)	HP	BHP	RPM	V/PH	REMARKS
CWP-1	CT-1	TACO	6009	KS	510	60	76	8	15	10.2	1750	480/3	12
CWP-2	CT-2	TACO	6009	KS	510	60	76	8	15	10.2	1750	480/3	12

- NOTES:

 1 PROVIDE WITH NON OVERLOADING MOTOR.
- 2 PROVIDE WITH PREMIUM EFFICIENCY MOTOR (5 HP OR ABOVE).

				COC	DLING	GT 6	WER	SCH	IEDULE			
						WATER			FAN SECTION		OPER	
	MARK	AREA SERVED	MANUFACTURER	MODEL	GPM	INLET *F	OUTLET °F	WB °F	HP	V/PH	WEIGHT LBS	REMARKS
	CT-1 & 2	CH-1 & 2	TOWER TECH	TTXL-i21950	510	95	85	78	(2) @ 5 HP EA.	480/3	9600	1 187 TONS 110% CAP
	 		 									
<u>ID</u>	CT-1 & 2	CH-1 & 2	EVAPCO	AT-212-59	510	95	85	78	(2) @ 5 HP EA.	480/3	10,200	2 187 TONS 110% CAP

- - 1 PROVIDE WITH 6' TALL LEGS, VIBRATION SWITCHES AND FACTORY CONTROL PANEL.
 - 2 PROVIDE WITH INVERTER DUTY MOTOR, LADDER & EXTENSION, REINFORCED BASIN FOR ALT. STEEL SUPPORT, SUMP SWEEPER PIPING, BOTTOM SUMP & DRAIN & VIBRATION SWITCH.

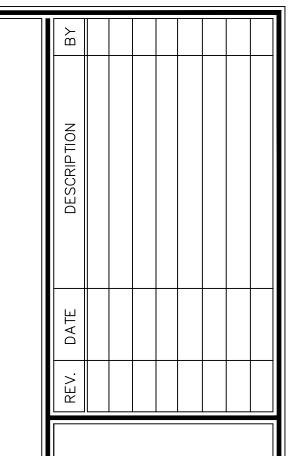
	TOWER FILTER SCHEDULE										
						МС	OTOR				
MARK	AREA SERVED	MANUFACTURER	MODEL	TYPE	GPM	HP	V/PH	REMARKS			
TF-1 & 2	CT-1 AND CT-2	LAKOS	TBI-0065-CMBV	CENTRIFUGAL SEPARATOR	65	1-1/2	460/3	123			

- NOTES:

 1 PROVIDE WITH NON OVERLOADING TEFC MOTOR.
- 2 PROVIDE WITH AUTOMATIC PURGE VALVE.
- 3 PROVIDE WITH CONTROL PANEL, INCLUDING STARTER W/ OVERLOAD, HOA SELECTOR SWITCH AND NEMA-4X ENCLOSURE.

	MECH	ANICAL LEGEND
SYMBOL	ABBR	DESCRIPTION
CHWS	— CHWS	CHILLED WATER SUPPLY
CHWR -	— CHWR	CHILLED WATER RETURN
CWS —	— cws	CONDENSER WATER SUPPLY
CWR —	— CWR	CONDENSER WATER RETURN
CD	— CD	CONDENSATE DRAIN
D	— D	DRAIN
ιδι	_	BALL VALVE
i\	— СНК	CHECK VALVE
	_	BUTTERFLY VALVE
M	— GV	GATE VALVE
++	_	STRAINER WITH VALVE AND THREADED HOSE CONNECTION
	_	UNION
₩	_	FLEXIBLE PIPE CONNECTION
Ф	_	THERMOMETER
Q	_	PRESSURE GAUGE
FS 	F.S.	FLOW SWITCH
C	DN	RISER DOWN
0	UP	RISER UP
•	POC	POINT OF CONNECTION

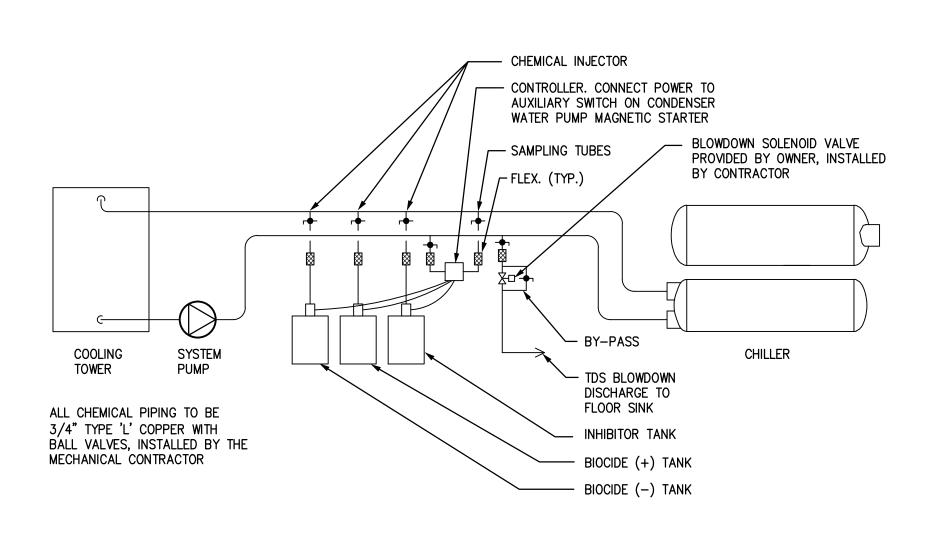
	ABBF	REVIATIO	INS
A	AMPS	LWB	LEAVING WET BULB TEMPERATURE
AFF	ABOVE FINISHED FLOOR	MAX	MAXIMUM
0	AT	МВН	THOUSAND BTU PER HOUR
AD	ACCESS DOOR	MCA	MINIMUM CIRCUIT AMPS
AP	ACCESS PANEL	MCC	MOTOR CONTROL CENTER
AV	AUTOMATIC AIR VENT	MECH	MECHANICAL
BDD	BACKDRAFT DAMPER	MFCB	MAXIMUM FUSE OR CIRCUIT BREAKER
BHP	BRAKE HORSEPOWER	MIN	MINIMUM
BTUH	BRITISH THERMAL UNITS PER HOUR	MV	MANUAL AIR VENT
CAP	CAPACITY	NC	NORMALLY CLOSED
CFM	CUBIC FEET PER MINUTE	NIC	NOT IN CONTRACT
CLG	CEILING	NO	NORMALLY OPEN
DB	DRY BULB TEMPERATURE	NO OR #	NUMBER
DIA	DIAMETER	NPSHR	NET POSITIVE SUCTION HEAD REQ'D
DIFF	DIFFERENCE	NTS	NOT TO SCALE
DN	DOWN	OBD	OPPOSED BLADE DAMPER
DWG	DRAWING(S)	OSA	OUTSIDE AIR
EXH	EXHAUST	ov	OUTLET VELOCITY
EAT	ENTERING AIR TEMPERATURE	PD	PRESSURE DROP
EDB	ENTERING DRY BULB TEMPERATURE	PHG	PHASE
EFF	EFFICIENCY	PSI	POUNDS PER SQUARE INCH
ELEV	ELEVATION	PSIG	POUNDS PER SQUARE INCH GAUGE
ESP	EXTERNAL STATIC PRESSURE	RA	RETURN AIR
EWB	ENTERING WET BULB TEMPERATURE	REQ'D	REQUIRED
EXT	EXTERNAL	RH	RELATIVE HUMIDITY
° F	DEGREES FAHRENHEIT	RM	ROOM
FD	FIRE DAMPER	RPM	REVOLUTIONS PER MINUTE
FF	FINISH FLOOR	SA	SUPPLY AIR
FLA	FULL LOAD AMPS	SCFM	CFM, STANDARD CONDITIONS
FLEX	FLEXIBLE	SD	SMOKE DETECTOR
FPM	FEET PER MINUTE	SFD	SMOKE AND FIRE DAMPER
FPS	FEET PER SECOND	SP	STATIC PRESSURE
FS	FLOW SWITCH	TEMP	TEMPERATURE
FT	FOOT OR FEET	UNO	UNLESS NOTED OTHERWISE
GA	GAGE OR GAUGE	VD	VOLUME DAMPER
GAL	GALLON(S)	VEL	VELOCITY
НТ	HEIGHT	V	VOLT
HP	HORSEPOWER	w	WATTS
HZ	HERTZ	w/	WITH
IN	INCH OR INCHES	w/o	WITHOUT
KW	KILOWATT	WG	WATER GAUGE
LBS	POUNDS	wT	WEIGHT
LDB	LEAVING DRY BULB TEMPERATURE	ø	ROUND, DIAMETER





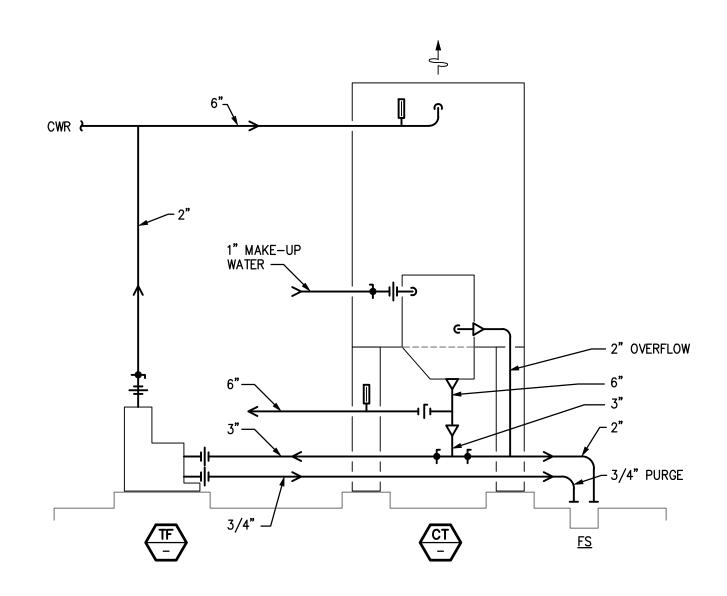
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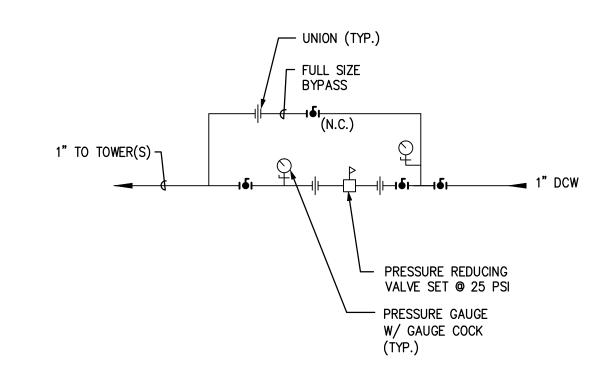
TOWER WATER TREATMENT DETAIL

NTS



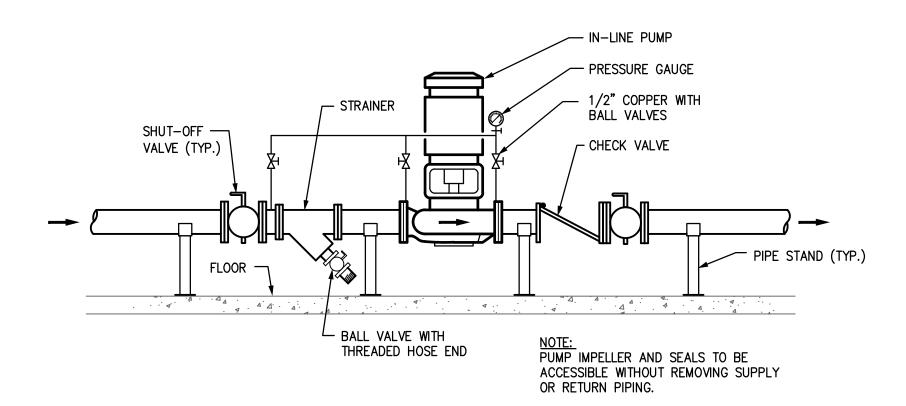
COOLING TOWER DIAGRAM

NTS MAKE-UP WATER, TOWER DRAIN AND ALL FILTER PIPING SHALL BE COPPER.



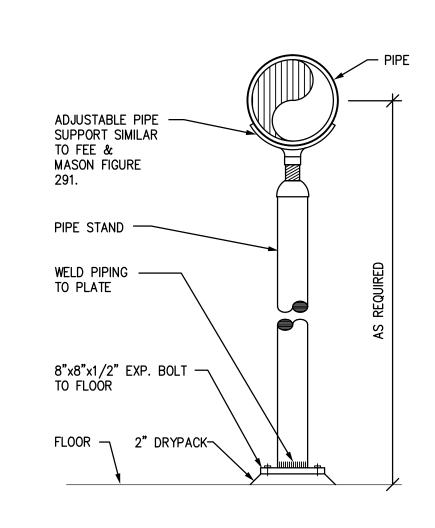
TOWER WATER MAKE-UP PIPING DIAGRAM

NITS



IN-LINE PUMP DETAIL

NTS

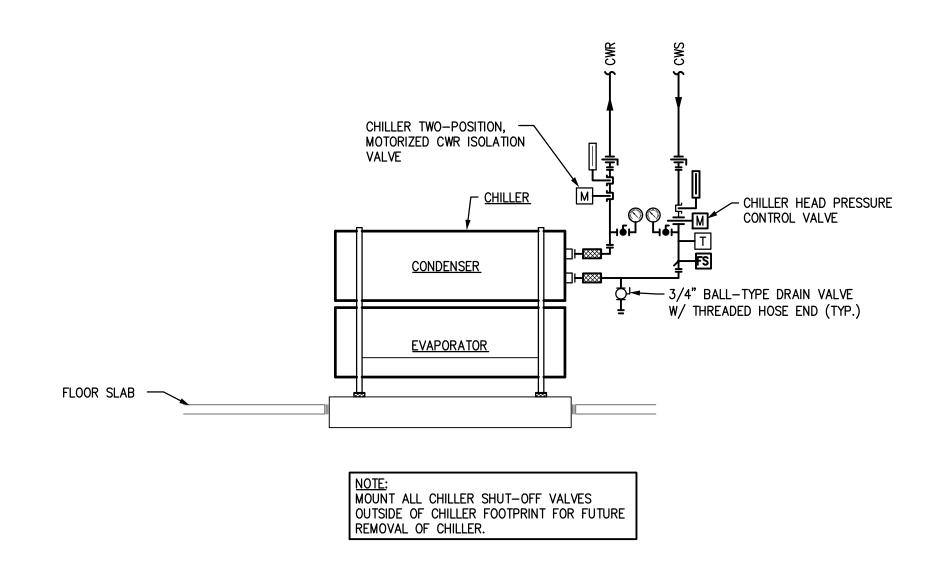


PIPE STAND DETAIL

NTS

GENERAL NOTES:

- PROVIDE 3/4" WELD-O-LETS FOR CONDENSER AND CHILLED WATER CHEMICAL TREATMENT PIPING.
- 2. PROVIDE 3/4" WELD-O-LETS FOR CONDENSER, CHILLED WATER AND THE CONTROL SYSTEM SENSORS. VERIFY QUANTITY AND LOCATIONS. SEE #3 BELOW.
- 3. ALL WELD-O-LETS, THERMOMETER, PETE'S PLUGS, CONTROLS, GAUGES, ETC., SHALL BE LOCATED 'BELOW' THE EQUIPMENT'S ISOLATION BUTTERFLY VALVE.



WATER COOLED CHILLER DIAGRAM

NTS

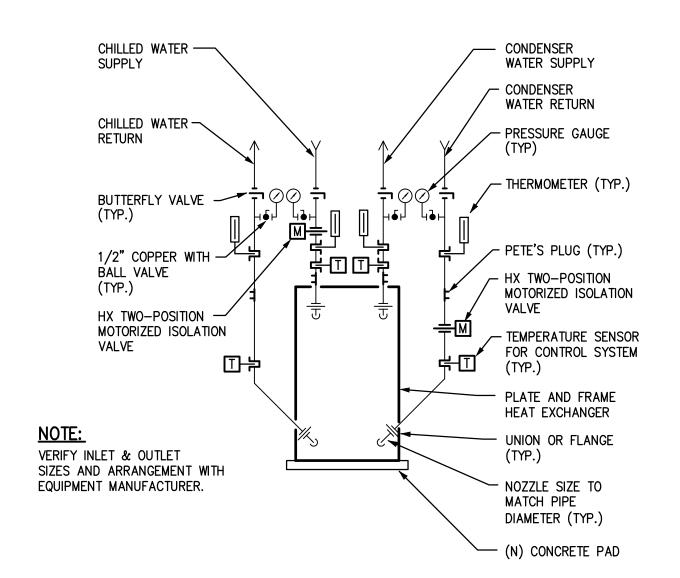
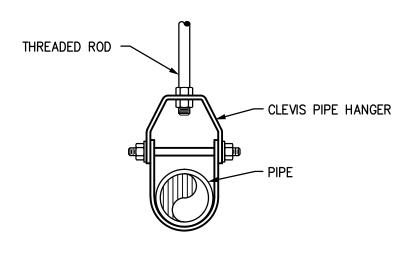


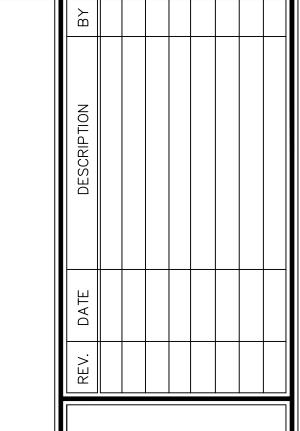
PLATE AND FRAME HEAT EXCHANGER PIPING DETAIL

NTS



NON-INSULATED PIPE SUPPORT DETAIL

TS



TO CORPORATED

There Avenue

2333 West Northern Arrigona 85023 Phoenix, Arizona 85023 Telephone:602.249.1320 Facsimile: 602.336.3270 F-Mail: Iswphx@lswr



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RUSSELL A.
BETZ

PRONA, U.S.

MARCH 15 CATE 10 COMMING AND ADDRESS AND ADDRESS

DR. BY LRW

DATE JOB NO. 2011-097.000

SHEET NO.

M-4

GERVASIO & ASSOC., INC.

CONSULTING ENGINEERS
77 EAST THOMAS ROAD, SUITE 120
PHOENIX, ARIZONA 85012
(602) 285-1720 • (602) 285-1530 (FAX)

JOB NO.:	
BY:	Ro

PARTIAL

ROJECT:	KYRENE DEL MILENTO-ME	CH. EQUIP
	4630E. FRYE RUAD	300
	PHOENIX, AZ 85048	•
LIENT:	LSW ENGINEERS	
	ITEM	SHEET
	DESIGN CRITERIA	0-1
	FOUNDATIONS	F-

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EXPIRES 12/31/11

GERVASIO & ASSOC., INC.

CONSULTING ENGINEERS

(602) 285-1720 • 77 East Thomas Road, Suite 120

Phoenix, Arizona 85012

Date_	8/11	Job No	1151
Ву	RD	Sheet No.	D-1

GENERAL - DESIGN CRITERIA

CODE	2006 INTERNATIONAL BUILDING CODE
DESIGN CRITERIA	
DEAD LOADS:	ROOF: NA PSF
LIVE LOADS:	FLOOR: NA PSF ROOF: PSF FLOOR PSF
LATERAL LOADS:	FLOOR: PSF WIND: 90 MPH (3 SECOND GUST WIND SPEED), EXPOSURE C
	SEISMIC: DESIGN CATEGORY B , $S_{DS} = 0.235$ $L = 1.35$
ALLOWABLE STRESSES	
CONCRETE:	REGULAR WT. CONC. $fc = 3,000$ PSI
•	STRUCTURAL DESIGN BASED ON $fc = 2,500$ PSI NO SPECIAL STRUCTURAL INSPECTION REQ'D.
	··· · · · · · · · · · · · · · · · · ·
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REINF. STEEL:	ASTM A-615, GRADE <u>60</u> , $F_y = \underline{60}$ KSI
STRUCT. STEEL:	ROLLED SECTIONS: ASTM A-992, GRADE 50, $F_y = 50 \text{ KSI}$ PLATES, ANGLES AND CHANNELS: ASTM A-36, $F_y = 36 \text{ KSI}$ BOLTS: ASTM A-307 PIPES: ASTM A-53, GRADE B, $F_y = 35 \text{ KSI}$ TUBES: ASTM A-500, GRADE B, $F_y = 46 \text{ KSI}$ WELDING: E-70 SERIES ELECTRODES
<u>SOIL</u> :	Q MAX = 1000 PSF @ 1.6" MIN. BELOW GRADE PEN CITY OF PHX AMENOMEMS SOIL REPORT BY NOWE
	DATED JOB #

GERVASIO	\mathcal{E}	AS	SO	C.	INC.
CONSULTING		ENG	INE	FR	9

Date	8/11
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Job No. ____ Sheet No.

PHOENIX, ARIZONA 85012-3115
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GERVASIO	& ASSOC.	INC.
CONSULTING	ENGINEER	5

Date ___

(602) 285-1720 • 77 East Thomas Hoad, Suite 120 PHOENIX, ARIZONA 85012-3115
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GERVASIO & ASSOC. INC	GERVASIO	&	ASSOC.	INC
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CONSULTING ENGINEERS

Date 8/11 Job No. 1151

(602) 285-1720 • 77 East Thomas Road, Suite 120 PHOENIX, ARIZONA 85012-3115

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CONSULTING ENGINEERS	Ву	20	Sheet No	F4
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GERVASIO & ASSOC. INC.

GERVASIO	& ASSOC. INC.	
CONCULTING	CMCIMEEDS	

By _____

Sheet No. __F5__

(602) 285-1720 • 77 East Thomas Road, Suite 120 PHOENIX. ARIZONA 85012-3115

PHOENIX, ARIZONA 85012-3115	
MONETICS & MATTER SEPTEMBLE FOOT TOUS	
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STRUCTURAL NOTES

(APPLY UNLESS NOTED OTHERWISE ON DRAWINGS)

CODE 1. 2006 International Building Code with City of Phoenix Amendments.

DESIGN LOADS Dead Loads:

2. Lateral Loads:

- a. Mechanical Equipment & Piping; See plans
- a. Wind: 90 MPH, 3 second gust. Exposure C, I=1.15 b. Seismic: Sps = 0.235, Seismic Design Category B, I = 1.25

FOUNDATIONS

- Bear footings on firm, compacted soil at 2'-0" minimum below existing slab.
- Allowable soil bearing pressure = 1000 psf, per IBC Table 1804.2. 3. Foundations are designed for dry conditions and must remain dry during construction.

CONCRETE

- 1. Minimum 3000 psi compressive strength at 28 days with Type II cement per ASTM TIES @ 12" O.C. C150; aggregate per ASTM C33, 1" minimum rock for footings and 3/4" minimum rock for other concrete. Replace cement with fly-ash at a rate of 15% to 20% by weight of the total cementitious materials. Fly-ash shall conform to ASTM C618, Type F. Structural design based on 2500 psi, no special inspection required.
- Maximum slump 4 1/2". ACI codes, recommendations and practices apply.
- Mechanically vibrate all concrete.
- Non-shrink grout shall be non-metallic with a minimum compressive strength of 4000 psi in 3 days, mixed and installed in accordance with the manufacturer's recommendations.
- Non-shrink grout shall be installed under column base plates before loading members.

REINFORCING

- 1. ASTM A615, Grade 60, deformed bars, except #2 bars. CRSI and ACI manuals
- Clear concrete coverages per details.
- Lap splices in concrete 36 bar diameters. Place reinforcing per ACI 318-05 and CRSI Standards.

STRUCTURAL STEEL

- AISC and AWS codes and handbooks apply. Plates: ASTM A36, Fy = 36 ksi minimum.
- 3. Bolts: ASTM A307.
- 4. Anchor bolts: ASTM F1554-99. Fy = 36 ksi minimum.
- Steel surfaces to be welded shall be thoroughly cleaned of all foreign matter including paint for at least 2 inches from the root of the weld.
- 6. Minimum embedment of bolts and anchors in masonry, grout or concrete shall be 5" with a 3" hook or headed stud unless noted otherwise on details.

SUPPLEMENTARY NOTES

- 1. Verify all dimensions and conditions prior to starting work. Notify the Mechanical Engineer of any discrepancies or inconsistencies.
- Verify in field all existing conditions shown on drawings.
- Establish and verify all openings and inserts for mechanical, electrical and plumbing with appropriate trades, drawings.
- Provide all necessary temporary bracing, shoring, guying, or other means to avoid excessive stresses and to hold structural elements in place during construction.
- Options are for the contractor's convenience. He shall be responsible for all changes necessary if he chooses an option and shall coordinate all details. The cost of additional design work necessitated by selection of an option shall be borne by the contractor. Options shall not delay construction schedule.
- The cost of additional design work due to errors or omissions in construction shall be borne by the contractor.
- Any engineering design provided by others and submitted for review shall bear the seal and signature of an Engineer registered in Arizona. If this engineering design requires special structural inspection, they shall be responsible for the inspection.
- Details on the Structural Drawings are typical. Verify all dimensions with the Mechanical Drawings.

SPECIAL INSPECTION

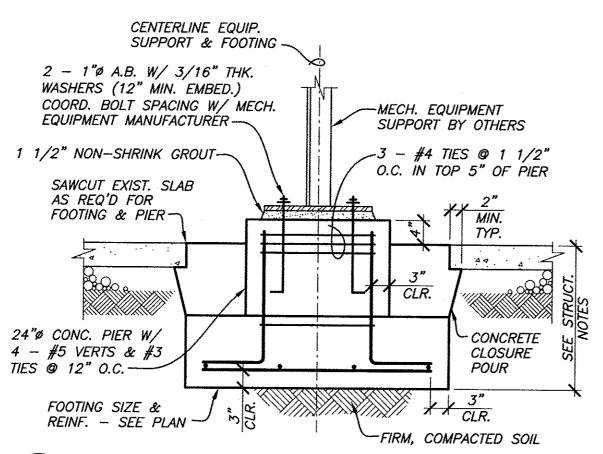
Special Inspection is required for all remodel work. Call Structural Engineer for inspection; phone number (602) 285-1720. Provide 48 hours notice.

Special inspection is to be provided in addition to the inspections conducted by the Department of Building Safety and shall not be construed to relieve the Owner or his authorized agent from requesting the periodic and called inspections required by Section 109 of the International Building Code. The special inspector shall be approved by the City Building Official prior to starting work.

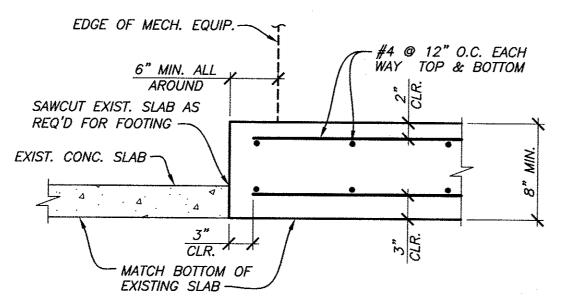
SPECIAL INSPECTION IS REQUIRED FOR THE FOLLOWING WORK: (PER IBC SECTION 1704)

NON-SHRINK GROUT:

During placement of non-shrink grout. This inspection may be done on a periodic basis.

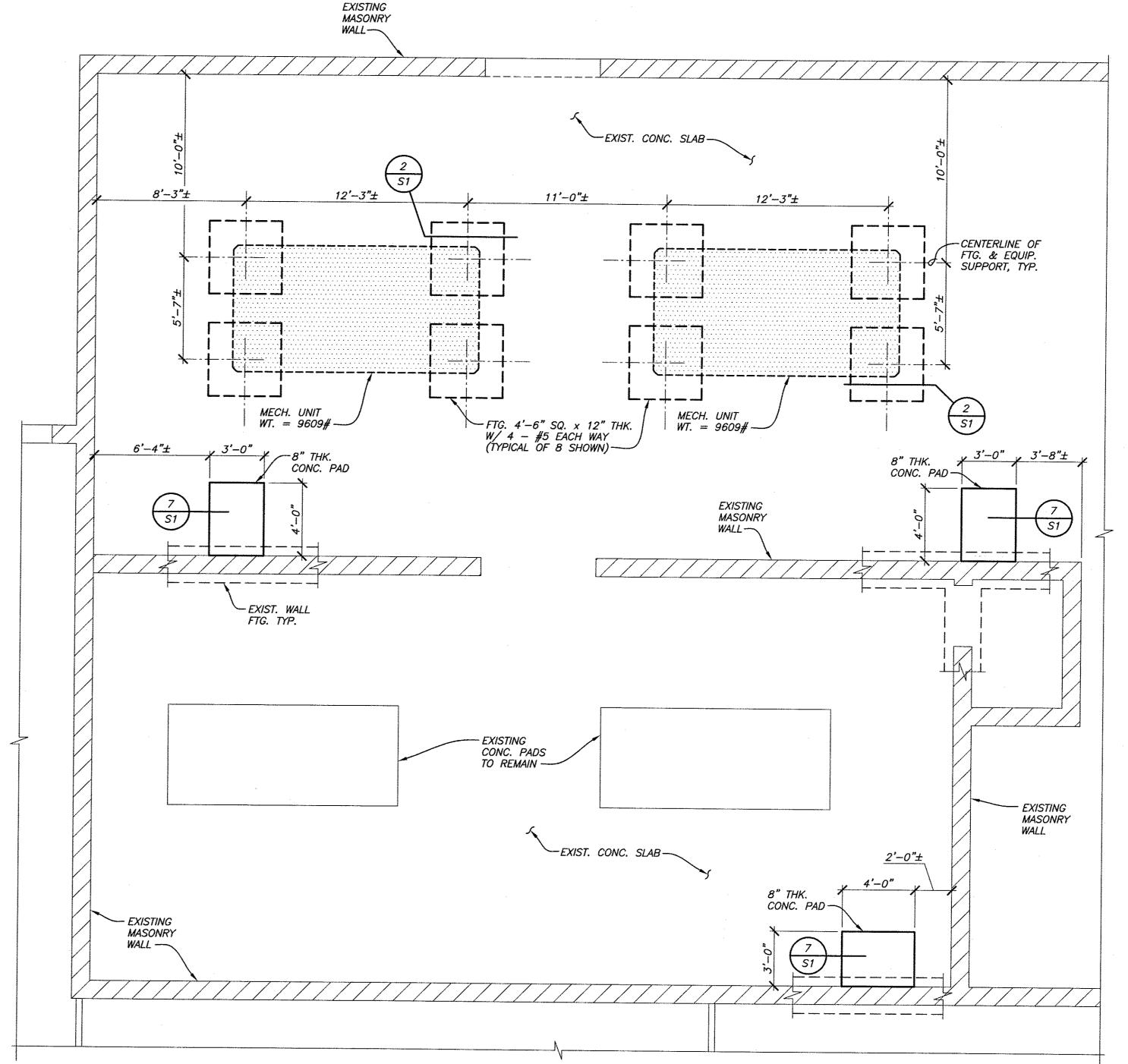


2) COOLING TOWER FTG. @ EXISTING



- EQUIPMENT FOOTING TO EXTEND 6" MIN. BEYOND EDGE OF MECHANICAL EQUIPMENT ON ALL SIDES.
- SEE MECHANICAL DRAWINGS FOR EQUIPMENT LOCATIONS.
- 3. PROVIDE ANCHOR BOLTS FOR EQUIPMENT AS REQUIRED BY MANUFACTURER.





FOUNDATION NOTES:

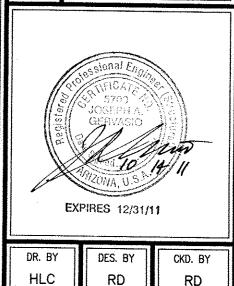
FIRM, COMPACTED SOIL.

- SEE STRUCTURAL NOTES ON SHEET <u>S-1</u>.
 AT COOLING TOWERS REMOVE EXISTING STEEL BEAMS,
- CONCRETE PIERS AND FOOTINGS AS REQUIRED FOR NEW FOOTINGS AND COOLING TOWER SUPPORTS.
- 3. SAWCUT EXISTING CONCRETE SLAB AS REQUIRED FOR NEW FOOTINGS AND PADS. FOOTINGS SHALL BEAR ON

PARTIAL FOUNDATION PLAN



del ARY **PARTIAL**



09/14/11 SHEET NO.

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